HRS DOCUMENTATION RECORD COVER SHEET

Name of Site: Eagle Zinc Co Div of T L Diamond
EPA ID No. ILD 980606941

Contact Persons

Site Investigation: Tony Wasilewski
Illinois Environmental Protection Agency
(217) 557-3200

Documentation Record: Tony Wasilewski
Illinois Environmental Protection Agency
(217) 557-3200

Laura Ripley
United States Environmental Protection Agency (USEPA) – Region 5
(312) 886-6040

Pathways, Components, or Threats Not Scored
The soil exposure pathway, air migration pathway, and the ground water migration pathway were not scored at this time due to the lack of sufficient documentation to support a scoring analysis. Soil samples obtained from the nearby residential areas identified primarily lead, cadmium and zinc concentrations that met observed release criteria (Refs. 1, p. 51646; 4, pp. 38 – 40; 8, p. 24) indicating that the soil exposure pathway is a concern to USEPA; however, this pathway was not evaluated at this time due to the limited data and because it would not change the listing decision.

The ground water pathway was also not evaluated since ground water use in the area is limited. The City of Hillsboro uses surface water for potable water. Since there is no nearby residential ground water use there were no ground water samples collected during the 1996 ESI or April 2005 ESI Addendum. Due to the fact that the soil exposure pathway, air migration pathway and ground water migration pathway were not evaluated does not indicate that these pathways would not add significantly to the HRS score.

HRS DOCUMENTATION RECORD

Name of Site: Eagle Zinc Co Div of T L Diamond

EPA Region: Region V   Date Prepared: March 2007

Street Address of Site*: 218 Industrial Park Drive

City, County, State: Hillsboro, Montgomery, Illinois 62049

General Location in the State: South West-Central Illinois, approximately 50 miles northeast of St. Louis, MO.

Topographic Map: Hillsboro Quadrangle, Illinois (USGS 7.5 Minute Series) (Ref 3).

Latitude: 39° 09' 40.20" North   **Longitude:** 89° 28' 35.10" West

Site Reference Point: Coordinates taken from approximate center of the property near the southwest end of the presently standing buildings on the Eagle Zinc property (Ref. 3).

		S	S^2
1.	Ground Water Migration Pathway Score (S_{gw})	NS	NS
2a.	Surface Water Overland/Flood Migration Component (From Table 4-1, line 30)	100	10000
2b.	Ground Water to Surface Water Migration Component (From Table 4-25, line 28)	NS	NS
2c.	Surface Water Migration Pathway Score (S_{sw} Enter the larger of lines 2a and 2b as the pathway score.	100	10000
3.	Soil Exposure Pathway Score (S_s (From Table 5-1, line 22)	NS	NS
4.	Air Migration Pathway Score (S_a) (From Table 6-1, line 12)	NS	NS
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$	100	10000
6.	**HRS Site Score** Divide the value on line 5 by 4 and take the square root	50.00	

* *The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area where the site is located. They represent one or more locations EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, placed, or otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.*

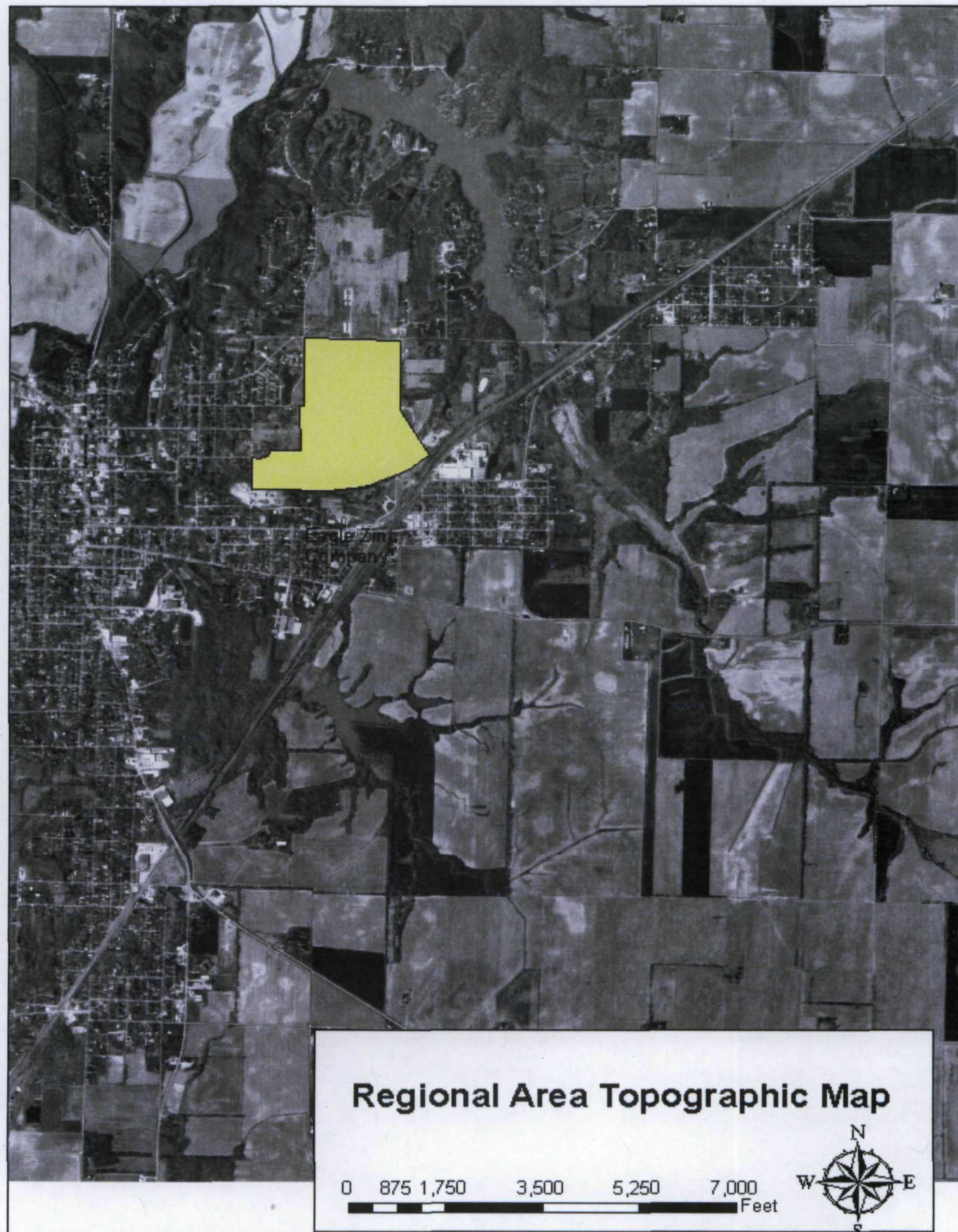
TABLE 4-1
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

Factor Categories and Factors		Maximum Value	Value Assigned
	DRINKING WATER THREAT		
	Likelihood of Release		
1.	Observed Release	550	550
2.	Potential to Release by Overland Flow		
	2a. Containment	10	NS
	2b. Runoff	25	NS
	2c. Distance to Surface Water	25	NS
	2d. Potential to Release by Overland Flow (lines 2a x (2b + 2c))	500	NS
3.	Potential to Release by Flood		
	3a. Containment (Flood)	10	NS
	3b. Flood Frequency	50	NS
	3c. Potential to Release by Flood (Lines 3a x 3b)	500	NS
4.	Potential to Release (lines 2d + 3c, subject to a maximum of 500)	500	NS
5.	Likelihood of Release (Higher of lines 1 and 4)	550	550
	Waste Characteristics		
6.	Toxicity/Persistence	A	NS
7.	Hazardous Waste Quantity	A	NS
8.	Waste Characteristics	100	NS
	Targets		
9.	Nearest Intake	50	NS
10.	Population		
	10a. Level I Concentrations	B	NS
	10b. Level II Concentrations	B	NS
	10c. Potential Contamination	B	NS
	10d. Population (Lines 10a + 10b + 10c)	B	NS
11.	Resources	5	NS
12.	Targets (lines 9 + 10d + 11)	B	NS
Factor Categories and Factors		Maximum Value	NS
	DRINKING WATER THREAT (Concluded)		
	Drinking Water Threat Score		
13.	Drinking Water Threat Score ((lines 5 x 8 x 12)/82,500, subject to a maximum of 100)	100	NS
	HUMAN FOOD CHAIN THREAT		
	Likelihood of Release		

14.	Likelihood of Release (same value as line 5)	550	550
Waste Characteristics			
15.	Toxicity/Persistence/Bioaccumulation	A	5×10^7
16.	Hazardous Waste Quantity	A	10000
17.	Waste Characteristics	1,000	560
	Targets		
18.	Food Chain Individual	50	45
19.	Population		
	19a. Level I Concentrations	B	NS
	19b. Level II Concentrations	B	0.03
	19c. Potential Human Food Chain Contamination	B	NS
	19d. Population (Lines 19a + 19b + 19c)	B	0.03
20.	Targets (lines 18 + 19d)	B	45.03
	Human Food Chain Threat Score		
21.	Human Food Chain Threat Score ((lines 14 x 17 x 20)/82,500, subject to a maximum of 100)	100	100
Factor Categories and Factors		Maximum Value	Value Assigned
ENVIRONMENTAL THREAT			
	Likelihood of Release		
22.	Likelihood of Release (same value as line 5)	550	550
	Waste Characteristics		
23.	Ecosystem Toxicity/Persistence/ Bioaccumulation	A	NS
24.	Hazardous Waste Quantity	A	NS
25.	Waste Characteristics	1,000	NS
	Targets		
26.	Sensitive Environments		
	26a. Level I Concentrations	B	NS
	26b. Level II Concentrations	B	NS
	26c. Potential Contamination	B	NS
	26d. Sensitive Environments (lines 26a + 26b + 26c)	B	NS
27.	Targets (value from 26d)	B	NS
	Environmental Threat Score		
28.	Environmental Threat Score ((lines 22 x 25 x 27)/82,500, subject to a maximum of 60)	60	NS
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE FOR A WATERSHED			
29.	Watershed Score[c] (lines 13 + 21 + 28, subject to a maximum of 100)	100	100

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE			
30.	Component Score (S_{of})[c], (highest score from line 29 for all watersheds evaluated, subject to a maximum of 100)	100	100

[a]Maximum= value applies to waste characteristics category.
[b]Maximum value not applicable.
[c]Do not round to nearest integer.



Souce:United States Geological Survey Topographical Map
in Digital Raster Graphic Format, 1:100,000 Scale
Quadrangle Index #39089b44

Eagle Zinc Property Location Map (area in yellow)

0 0.045 0.09 0.18 0.27 0.36 Miles

Source: Illinois Department of Natural Resources
Geospatial Data Clearinghouse:
Digital Orthographic Quadrangles, 1999, accessed 2005, Ref 4

Eagle Zinc Company Sample Location Map

Drainage flow direction

N W E S

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Ref.
No. Description of the Reference

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SECTION 2.0 SITE BACKGROUND

2.0.1 Site Description

The Eagle Zinc Div of T L Diamond facility (Eagle Zinc) is located on the west side of Industrial Park Drive in Hillsboro, Montgomery County, Illinois. Eagle Zinc is approximately 132 acres in size and is legally described as having portions being located in the Southeast Quarter of Section One and the Northeast Quarter of Section twelve, T.8N, R.4W; and part of the Southwest Quarter of Section Six, Township 8N, Range 3W (Ref. 5, pp. 2, 3, 5, 6). The City of Hillsboro has a population of 4,272 people (Ref. 11). The property is currently vacant and the surrounding area consists of Industrial Park Drive on the east side with vacant land beyond (Ref. 10, pp. 1, 2). Smith Road borders the north side of the property with open land, an active business and a recreational area lying to the north (Ref. 10, pp. 1, 2). The west boundary of the property is irregular in shape and is bordered by Brailly Road on the north and vacant land further to the south (Ref. 10, pp. 1, 2). Single-family residential houses lie along Brailly Road and along nearby streets further west (Ref. 10, pp. 1, 2). Private businesses, including a wood treating facility and lumberyard, lie south of the facility along Ash Street (Ref. 10, pp. 1, 2). The property consists of approximately 132 acres of which approximately 26 acres are currently occupied by structures (Refs. 4, pp. 4, 107, 108; 5, pp. 2, 5; 8, pp. 2, 17, 18, 19; 10, pp. 1, 2; 12, p. 2; 32, pp. 1-6; 34; 40; 47, p. 2).

As of January 2006 there were approximately 23 structures remaining on the property (Refs. 4, pp. 107, 108; 8, pp. 18, 19; 10, pp. 1, 2; 12, p. 2; 32, pp. 1-6; 34; 40). The industrial activities that were conducted in these structures included manufacturing/processing, office/laboratory, equipment, smelting slab zinc and zinc oxide production, raw material and finished product storage, bag houses and maintenance (Refs. 4, pp. 5 – 8; 8, pp. 2, 4; 12, pp. 2-5; 45, p. 3; 47, pp. 1-5). The structures are located mainly on the east portions of the facility, with the area west of the structures containing large piles of waste materials from the smelting and past manufacturing activities (Refs. 4, pp. 107, 108; 8, pp. 18, 19; 10, p. 1; 32, pp. 1-6; 34; 40).

Surface water from the facility flows into one of two separate overland flow paths. The first are two small ponds located at the northeastern portion of the property that discharges to an unnamed tributary that originates in the field located on the north side of the property. The unnamed tributary flows east under Industrial Park Drive and meanders to the northeast where it enters Lake Hillsboro approximately

3,330 feet from the property [Refs. 4, pp. 4, 5, 35, 36, 46A (15 mile surface water map); 6, p. 29; 8, pp. 2, 3, 10-12, 19, 33; 10, pp. 1, 2; 12, p. 14; 40; 47, p. 6; 48].

A larger pond is located within the southwestern portion of the property (Refs. 10, p. 1; 47, pp. 6, 10). It consists of a slag dam constructed to contain runoff from the slag and cinders area located in the central and southwest portion of the facility (Refs. 10, pp. 1, 2; 23, pp. 1, 2; 47, p. 10). Runoff from the pond overflows from the dam on the west side and becomes part of a small brook. There is a drainage ditch on the south side of the property along an abandoned railroad right-of-way that flows west and joins with the dam overflow below the dam. The north bank of the ditch along Eagle Zinc property consists of a wall of slag and cinders along much of its length. The brook then flows west for approximately 1,500 feet to an unnamed tributary of Middle Fork Shoal Creek. It then flows northward for approximately 3,000 feet into Middle Fork Shoal Creek. The Middle Fork Shoal Creek then flows southwest approximately six miles before it enters Shoal Creek. This is the overland flow for the deep slag pile located on the southern portion of the property [Refs. 3; 4, pp. 4, 5, 35, 36, 46A (15 mile surface water map); 8, pp. 2, 3, 10-12, 19, 33; 10, pp. 1, 2; 12, p. 14; 18; 47, p. 6].

The west-central portion of the property is lower and contains wet areas, which are presently heavily vegetated. Much of the runoff from this section would flow to the south into the large pond. The northwestern area of the property is relatively flat and is not heavily vegetated (Ref. 10, p. 2).

The facility has a locked gate to prevent unauthorized vehicular traffic (Ref. 10, p. 1). The facility is in a relatively remote area of the community and is separated from the public with the exception of houses, which are located along Brailly Street, northwest of the property (Ref. 10, p. 2). The perimeter of Eagle Zinc is fenced but it would be possible for trespassers to enter by climbing over the fence or through holes and gaps (Ref. 10, p. 2). The land east of the property across Industrial Park Road is sparsely populated. An asphalt company is located on the south side and a residential home with acreage on the north side (Ref. 10, p. 2).

Lake Hillsboro is located northeast of Eagle Zinc and has homes with large lots along its shore. Surface water runoff from the eastern area of the property enters Lake Hillsboro near the southwest end of the lake north of Smith Road. North of the facility, across Smith Road, lies open land with an active business. Further north is a recreational area with baseball diamonds and a country club (Ref. 10, p. 2).

A public housing complex operated by Montgomery County is located to the northwest of the property across Brailly Road. Residential houses are located approximately 1,000 feet west. The southwestern area of the property is a drainage way and is too low for the construction of dwellings (Ref. 10, p. 2).

The properties directly south of the facility along Ash Street are used for commercial purposes. Activities conducted at these properties include a lumberyard and wood pressure treating facility. Residences lie further south along Route 16. A walk around nearby streets revealed some areas of what appeared to be waste material from the Eagle Zinc facility in residential yards or along the street and sidewalks (Ref. 10, p. 2).

The drainage pathway leading from the eastern side of the property to Lake Hillsboro was walked prior to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Expanded Site Inspection (ESI) (Ref. 10, p. 2). The area is heavily vegetated and has a broad flat plain along the drainage stream (Ref. 10, pp. 2, 3). The probable point of entry (PPE) into surface water is where the stream enters Lake Hillsboro [Refs. 4, pp. 4, 5, 35, 36, 46A (15 mile surface water map); 8, pp. 2, 3, 10-12, 19, 33, 41; 10, pp. 2, 3; 12, p. 14; 25; 40; 48].

Access to the facility can be obtained via Industrial Park drive (Ref. 10, p. 1). There is a locked gate and the facility has a low fence to prevent unauthorized vehicular access (Ref. 10, p. 1). There are no onsite employees or guard to prevent people entering the property (Ref. 10, p. 1). The nearest residents are located approximately 300 feet west of the property (Ref. 10, p. 2). The City of Hillsboro obtains its drinking water from surface water from Lakes Hillsboro and Glenn Shoals (Ref. 7). The City of Hillsboro has been served by a municipal potable water system since the existing water treatment plant was constructed in 1926 (Refs.12, p. 16; 51). While the well searches indicated records of some older domestic wells located within a one-mile radius of the facility, residents of Hillsboro, as well as incorporated areas located within one mile of the facility, are provided with public water (Refs. 4, pp. 34, 35; 7; 12, p. 16; 51).

The area's shallow geology consists of approximately 50 to 100 feet of Pleistocene glacial till and outwash unconsolidated glacial deposits (Refs. 12, p. 14; 43). Underlying the glacial deposits is bedrock consisting of the Pennsylvanian Bond Formation consisting mainly of limestone with some layers of shale and sandstone (Refs. 12, p. 15; 44). Soil borings and monitoring well installation logs suggest that in most areas over the property clay, silty clay and sandy clay extend to a depth of 15 or more feet below ground surface (Ref. 12, pp. 15, 157-286).

2.0.2 FACILITY HISTORY

According to historical Sanborn maps of the area, Eagle-Picher Industries has been in operation since at least 1923 (Ref. 34). Operations continued by Eagle Picher Industries until 1980 (Refs. 4, p. 5; 8, p. 4; 12, p. 3; 23, p. 1; 47, p. 2). On November 24, 1980, Sherwin Williams Chemical Division bought the plant from Eagle Picher and operated it until 1984 (Refs. 4, p. 5; 8, p. 4; 12, p. 3; 45, p. 3; 47, p. 2). The facility was acquired in 1984 by Eagle Zinc Company, which is a division of T. L. Diamond Company of New York City (Refs. 35; 36; 47, p. 2). The facility ceased operations at the plant in 2003 (Ref. 37). Products produced during the years include: zinc, sulfuric acid, zinc oxide and leaded zinc oxide (Refs. 4, p. 6; 8, p. 4; 12, pp. 3-5; 45, pp. 3, 4; 47, pp 1-5). The leaded zinc oxide that was made at Eagle Zinc was produced by using the American process, which combined zinc ore concentrates with a high level of impurities (Refs. 46, p. 1; 47, p. 3). Waste materials generated included slag, rotary kiln residue, muffle dross, metallic zinc particles, and refractory brick (Refs. 8, p. 4; 12, pp. 4-6; 47, pp. 2-5).

Illinois EPA first inspected the property in the early 1970s, at which time it was discovered that municipal refuse, scrap metal and drums were dumped into a pond on the property (Refs. 18; 47, p. 2). The facility was initially listed on Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) in June 1981 (Refs. 4, p. 110; 19, pp. 1, 2; 47, p. 2). Illinois EPA conducted a Preliminary Assessment in 1984 (Refs. 4, p. 110; 20, pp. 1-6). In 1981 and 1982, Illinois EPA collected surface water samples from a ditch carrying discharge from the reservoir near the west edge of the property for inorganic analysis (Refs. 21, pp. 1-3; 23, pp. 1-8; 47, p. 2). The water samples contained cadmium, zinc, iron, lead and copper above state surface water standards and resulted in a Notice of Violation from Illinois EPA (Refs. 23, pp. 1-8; 28, pp. 1-3; 47, p. 2). This resulted in Sherwin Williams removing approximately 18,000 tons of residue materials from 10 acres of the plant property (Ref. 22, pp. 1-3; 47, p. 2).

In October 1993, Illinois EPA conducted a CERCLA ESI of the property and surrounding residential area (Ref. 4, pp. 13, 110). Soil samples collected on the property had elevated levels of arsenic, cadmium, copper, zinc, and lead (Ref. 4, pp. 38, 98-101). Some residential samples contained elevated levels of arsenic, and the Illinois Department of Public Health indicated that levels of manganese were present that may pose a possible human health concern (Ref. 24, p. 1). Sediment samples collected from the intermittent stream north of the facility had elevated levels of arsenic, cadmium, copper, lead and zinc (Ref. 4, pp. 37, 97).

The facility was issued a National Pollutant Discharge Elimination Systems (NPDES) permit on June 20, 2000 (Ref. 38, p. 1). As a requirement of the permit a two-cell retention system was constructed at the northeast area of the property that would enable the settling of particles from runoff prior to discharging into the east off the property drainage pathway (Ref. 38, p. 1-7). This drainage pathway leads to Lake Hillsboro (Refs. 10, p. 2; 38, p. 2). The permit was terminated on July 10, 2003 because the facility had closed and the discharge had been eliminated (Refs. 29, pp. 1, 2; 30; 31; 39).

2.2 SOURCE CHARACTERIZATION

2.2.1 SOURCE IDENTIFICATION

Name of source: Shallow Slag Pile   Number of source: 1

Source Type: Pile: Waste pile

Description and Location of Source (with reference to a map of the site):

Description

The first source identified at Eagle Zinc is a waste pile that has been spread throughout a large portion of the facility. For the purpose of this report this source shall be referred to as and is called the "shallow slag pile". The shallow slag pile is located in the northwestern half of the property and surrounds most of the standing buildings (Refs. 8, p. 19; 14, p. 1; 40; 47, p. 10). The shallow slag pile covers approximately 430,626.8 ft^2 (Refs. 4, pp. 8, 45; 8, pp. 2, 8, 19, 48-53; 14, p. 2; 32, photos 1-6; 40). The overland flow pathway was documented to flow from sample X313, which is part of the shallow slag pile, northeast towards the unnamed tributary (Ref. 6, p 29).

Samples of the shallow slag pile were collected during the CERCLA ESI Addendum. Samples X307, X308, X309, X310/X312, X311 and X313 were all obtained from the shallow slag pile at depths ranging between 0-1/2 inch (Refs. 6, pp. 10-12; 8, pp. 2, 8, 19, 23, 26, 48-53; 14, p.2; 40). Samples X307, X308, X309, X310/X312, X311 and X313 document the presence of the following hazardous substances: arsenic, cadmium, chromium, copper, lead, nickel, silver, and zinc (Refs. 6, pp. 10-12; 8, pp. 2, 8, 19, 23, 26, 48-53; 40; 41, pp. 22, 23, 26-30; 37-43).

Location

The shallow slag pile is located on the northwestern portion of the facility and surrounds the remnants of various buildings (Refs. 8, p. 19; 14, p. 1; 40; 47, p. 10). See Eagle Zinc Sample Location Map of this Documentation Record (p. 6).

Containment

Gas release to air: The air migration pathway was not scored; therefore, gas containment was not evaluated.

Particulate release to air: The air migration pathway was not scored; therefore, particulate containment was not evaluated.

Release to ground water: The ground water pathway was not scored; therefore, ground water containment was not evaluated.

Release by overland flow migration and/or flood: the shallow slag pile does not have a complete, maintained, engineered cover, or functioning and maintained run-on control system and run-off management system. The shallow slag pile has no containment structures to limit the flow of contamination from the pile (Refs. 8, pp. 19, 23, 26, 48-53; 10, p. 1; 12, pp. 2, 18; 32, photos 1-6; 47, p. 10).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

The hazardous substances arsenic, cadmium, chromium, copper, lead, nickel, silver and zinc were detected in all samples obtained from the shallow slag pile during the CERCLA ESI Addendum. Samples X307, X308, X309, X310/X312, X311 and X313 were all obtained from Source 1 (Refs. 6, pp. 10-12; 8, pp. 2, 8, 19, 23, 26, 48-53; 40; 41, pp. 22, 23, 26-30, 37-43) and most accurately define the aerial extent of the shallow slag pile. The analytical results included in Table 6 are evidence of the contamination associated with the shallow slag pile (Refs. 6, pp. 10-12; 8 pp. 2, 8, 19, 23, 26, 48-53; 40; 41, pp. 22, 23, 26-30. 37-43). Source sample locations are presented on Figure 4 of the ESI Addendum (Refs. 8, p. 19; 40). SQLs were calculated for each substance according to procedures outlined in Reference 13. The SQLs were used for comparison purposes in order to establish the presence of CERCLA-eligible hazardous substances.

Table 1
Hazardous Substances Associated with the shallow slag pile

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Sample Quantitation Limit (mg/kg)	References
X307 (ME00L6)	Waste	4/25/05	Arsenic	141	.401	Refs. 6, p. 10; 8, pp. 19, 23, 48; 13, p. 6; 41, pp. 22, 26, 28-30, 37; 42, pp. 1, 3; 50, pp. 139-144, 149, 151-153, 160
			Cadmium	152	.172	
			Chromium	169	.206	
			Copper	454	.607	
			Lead	7230	.321	
			Nickel	65.3	.321	
			Silver	3.6	.367	
			Zinc	194000	.344	

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Sample Quantitation Limit (mg/kg)	References
X308 (ME00L7)	Waste	4/25/05	Arsenic	48.1	.359	Refs. 6, p. 11; 8, pp. 19, 23, 49; 13, p. 6; 41, pp. 22, 26, 28-30, 38; 42, pp. 1, 3; 50, pp. 139-144, 149, 151-153, 161; 55, p. 1
			Cadmium	18.2	.154	
			Chromium	902	.185	
			Copper	21900	.544	
			Lead	20300	.287	
			Nickel	9100	.287	
			Silver	27.3	.329	
			Zinc	381000	.308	
X309 (ME00L8)	Waste	4/26/05	Arsenic	34.2	.392	Refs. 6, p. 11; 8, pp. 19, 23, 50; 13, p. 6; 41, pp. 22, 26, 28-30, 39;
			Cadmium	60.5	.168	
			Chromium	278	.202	
			Copper	33100	.594	
			Lead	13000	.314	42, pp. 1, 3;
			Nickel	5350	.314	50, pp. 139-144, 149, 151-153, 162
			Silver	26	.359	
			Zinc	258000	.336	
X310 (ME00L9)	Waste	4/25/05	Arsenic	61.1	.426	Refs. 6, p. 12; 8, pp. 19, 23, 52; 13, p. 6; 41, pp. 22, 26, 28-30, 40; 42, pp. 1, 3; 50, pp. 139-144, 149, 151-153, 163; 55, p. 1
			Cadmium	29	.183	
			Chromium	1460	.219	
			Copper	20300	.646	
			Lead	16800	.341	
			Nickel	17200	.341	
			Silver	26.6	.390	
			Zinc	383000	.365	
X311 (ME00M0)	Waste	4/26/05	Arsenic	52.6	.410	Refs. 6, p. 12; 8, pp. 19, 23, 51; 13, p. 6; 41, pp. 23, 27, 28-30, 41; 42, pp. 1, 3; 50, pp. 139-144, 150, 151-153, 164
			Cadmium	42	.176	
			Chromium	1620	.211	
			Copper	19800	.621	
			Lead	18400	.328	
			Nickel	13000	.328	
			Silver	45.5	.375	
			Zinc	407000	.352	

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Sample Quantitation Limit (mg/kg)	References
X312 (ME00M1)	Waste	4/26/05	Arsenic	53.4	.429	Refs. 6, p. 12; 8, pp. 19, 23, 52; 13, p. 7; 41, pp. 23, 27, 28-30, 42; 42, pp. 2, 4; 50, pp. 139-144, 150, 151-153, 165
			Cadmium	34.9	.184	
			Chromium	1480	.221	
			Copper	23900	.650	
			Lead	16400	.343	
			Nickel	9110	.343	
			Silver	23.4	.392	
			Zinc	354000	.368	
X313 (ME00M2)	Waste	4/26/05	Arsenic	175	.475	Ref. 6, p. 12; 8, pp. 19, 23, 53; 13, p. 7; 41, pp. 23, 27, 28-30; 43; 42, pp. 2, 4; 50, pp. 139-144, 150-153, 166
			Cadmium	97.8	.204	
			Copper	1400	.719	
			Lead	29100	.380	
			Nickel	287	.380	
			Silver	6.6	.434	
			Zinc	387000	.407	

Notes: a. SQL is a calculated value. Calculations are provided as a part of this documentation record (Ref. 13, pp. 6, 7).

2.4.2 HAZARDOUS WASTE QUANTITY

Insufficient information exists to evaluate Hazardous Constituent Quantity, Hazardous Wastestream Quantity, and Volume (Ref. 1, pp. 51590, 51591). Therefore the hazardous waste quantity value will be calculated using the area of the waste pile.

2.4.2.1.1. Hazardous Constituent Quantity (Tier A) – Not Calculated

The hazardous constituent quantity is not available; therefore it is not possible to adequately determine a hazardous waste constituent quantity (Tier A) for Source 1 (Ref. 1, pp. 51590, 51591). As a result the evaluation of hazardous waste quantity proceeds to the evaluation of Tier B, hazardous waste stream quantity (Ref. 1, pp. 51590, 51591).

2.4.2.1.2. Hazardous Wastestream Quantity (Tier B) – Not Calculated

The hazardous wastestream quantity is not available; therefore it is not possible to adequately determine a hazardous wastestream quantity (Tier B) for Source 1 (Ref. 1, p. 51591). As a result the evaluation of hazardous waste quantity proceeds to the evaluation of Tier C, volume (Ref. 1, p. 51591).

2.4.2.1.3. Volume (Tier C) - 0

The volume of the shallow slag pile (Source 1) is not available; therefore it is not possible to adequately determine a volume (Tier C) for Source 1 (Ref. 1, p. 51591). As a result the evaluation of hazardous waste quantity proceeds to the evaluation of Tier D, area (Ref. 1, p. 51591).

2.4.2.1.4. Area

The area inside sampling points of the shallow slag pile (i.e., the land surface under the pile, not the surface areas of the pile) was measured using a desktop Geographic Information System and aerial photography. This is the area inside sampling points X313 – X307 – X308 – X311– X309 – X313. The measurement of the area between sampling points of the slag pile was measured in accordance with the procedures outlined in Reference 14. The structures inside the area were not included. The square footage under the structures, which were located within the area designated as shallow slag pile were subtracted from the total area calculations (Ref. 14, pp. 1, 2).

The area at the base of the pile, (not the surface area of the pile), in square feet was divided by 13 to calculate the source Hazardous Waste Quantity (Ref. 1, p. 51591, Table 2-5).

Source Type	Units (ft^2)	References
Shallow Waste Pile	430,626.8 ft^2	Ref. 14

Sum (ft^2): 548813

Equation for Assigning Value (Table 2-5): Hazardous Waste Quantity = $\frac{430{,}626.8\ \mathrm{ft}^2}{13}$

Area Assigned Value: 33,125.1

2.4.2.1.5. Source Hazardous Waste Quantity Value

According the HRS Rule, the highest of the values assigned to each source for hazardous constituent quantity (Tier A), hazardous waste stream quantity (Tier B), volume (Tier C), and area (Tier D) should be assigned as the source hazardous waste quantity. Because area (Tier D) was the only tier evaluated for Source 1, the area will be assigned as the source hazardous waste quantity value for Source 1 (Ref. 1, p. 51591).

Highest assigned value assigned for shallow slag pile from Table 2-5: 33,125.1

2.4.2.2 Calculation of Hazardous Waste Quantity Factor Value

The sum of the source hazardous waste quantity values assigned to all sources for the pathway being evaluated is used to select a factor value from HRS Table 2-6 as the hazardous waste quantity factor value (Ref. 1, p. 51591).

SUMMARY OF SOURCE DESCRIPTIONS

Source No.	Source Hazardous Waste Quantity Value	Source Hazardous Constituent Quantity Complete? (Y/N)	Containment Factor Value by Pathway					
			Soil Exposure	Ground Water (GW) (Table 3-2)	Surface Water (SW)		Air	
					Overland/ flood (Table 4-2)	GW to SW (Table 3-2)	Gas (Table 6-3)	Particulate (Table 6-9)
1	33,125.1	N	NA	NE	10	NE	NE	NE

Notes: NA – Not Applicable
NE – Not Evaluated

Description of Other Possible Sources

There are some other possible sources identified at Eagle Zinc where hazardous substances were detected. The first possible source is a waste pile ("deep slag pile") located on the southern portion of the facility. This possible source extends from the large pond at the southwest part of the property to the small pond at the southeast area of the facility. The deep slag pile runs in a west to east direction and borders the south side of the facility (Refs. 8, p. 19; 14, p. 1; 47, p. 10). The deep slag pile covers at least 306,562 ft^2 and its height varies from several feet to 20-40 feet along its length (Refs. 4, pp. 4, 8, 45, 73; 8, pp. 2, 8, 19, 42-47; 10, p. 1; 14, p. 2; 32, photos 1-6; 47, p. 10). The deep slag pile is composed of waste material generated from the primary zinc smelting process and waste materials generated during the production of the sulfuric acid, zinc oxide and leaded zinc oxide (Refs. 4, p. 6; 8, p. 4; 12, pp. 3-5; 45, p. 3; 47, pp. 2, 10). It is unknown when the deep slag pile began to accumulate but according to aerial photographs, the deep slag pile was in existence in 1956 (Ref. 32, photos 1-6). Samples of the deep slag pile were collected during the CERCLA ESI Addendum. Samples X301, X302, X303, X304, X305, and X306 suggest the presence of the following hazardous substances within the pile: arsenic, barium, cadmium, copper, lead, mercury, nickel, silver and zinc and manganese (Refs. 8, pp. 19, 23, 26, 42-47; 41, pp. 21, 22, 26, 28-30, 31-36). The deep slag pile was not used in the calculation of the HRS score; however, the drainage pathway and inwater segment downstream of the deep slag pile merges with the same inwater segment as Lake Hillsboro (Refs. 8, pp. 3, 19, 23, 26, 42-47; 10, p. 1; 12, pp. 2, 14, 18, 98; 32, photos 1-6; 47, pp. 6, 10; 48). Although the deep slag pile is of concern, there is insufficient analytical data to adequately evaluate this watershed.

The second possible source at the Eagle Zinc Company facility is contaminated soil, which consists of sediment along the overland drainage pathway from contaminated soil to Lake Hillsboro (Refs. 8, p. 19; 14, p. 1). The contaminated soil originates from a low area at the northeastern portion of the property and collects drainage from a portion of the facility. The drainage flows off the property in a northeasterly direction into Lake Hillsboro, which is located approximately one half mile from the property (Refs. 3; 4, pp. 12, 44, 45; 8, pp. 11, 12, 17; 10, p. 1; 12, p. 14, 98; 14, p. 2; 20, p. 5; 40; 47, pp. 6, 10). Samples of contaminated soil consisting of sediment along the drainage pathway were collected during the CERCLA ESI addendum. Samples X202, X203/X204, X205, X206, X207, and X209 suggest the presence of the following hazardous substances: arsenic, cadmium, cobalt, copper, lead, manganese, mercury, silver and zinc (Refs. 6, pp. 14–19; 8, pp. 6, 7, 12, 19, 22, 25, 54, 56-62; 41, pp. 23, 24, 28-30, 44-47, 49-50, 79, 84-85, 87-89, 90-92; 42, pp. 2, 4, 5, 8). The contaminated soil originates at the northeastern area of the Eagle Zinc Company property and extends in a northeasterly direction for approximately 3,352.3 ft. to Lake Hillsboro (Refs. 8, p. 19; 14, pp. 1, 2). The contaminated soil does not have a complete, maintained, engineered cover, or functioning and maintained run-on control system and run-off management system. This other possible source has no containment structures that would inhibit the flow of contamination from the contaminated soil consisting of sediments in the drainage pathway into the perennial waterway (Refs. 8, pp. 6, 7, 12, 19, 22, 25, 54, 56-62; 10, pp. 1, 2). The contaminated soil was not used in the calculation of the HRS score because the area could not be adequately defined based upon the existing data. The contaminated soil would not add significantly to the overall HRS site score.

A third possible source is a two-cell retention pond that was formerly used at the northeast area of the property to enable the settling of particles from runoff prior to discharging into the east off the property drainage pathway (Ref. 38, p. 1-7). Insufficient information is available to score this possible source at this time.

4.0 SURFACE WATER MIGRATION PATHWAY

4.1 OVERLAND/FLOOD MIGRATION COMPONENT

4.1.1.1 Definition of Hazardous Substance Migration Pathway for Overland/Flood Component

The source area is located in one watershed (Ref. 25). Surface water draining from Eagle Zinc was observed during the April 2005 ESI Addendum (Refs. 4, p. 110; 6, pp. 14-19; 8, pp. 6, 12, 22, 54, 56-62). During the inspection the intermittent drainage way had a slight flow from the facility to Lake Hillsboro. The overland flow path for Source 1 originates near the northeast portion of the Eagle Zinc property by Smith Road. The area north of the buildings contains a low area that receives much of the shallow slag pile drainage. Water from this low area forms a small unnamed tributary to Lake Hillsboro that intermittently flows east beneath Industrial Park Road (Refs. 4, pp. 12; 6, p. 29; 8, pp. 2-3, 11-12, 18-19; 10, p. 1; 12, p. 14; 14, pp. 1, 2; 40; 47, pp. 6, 10). The drainage pathway is heavily vegetated and has a broad flat flood plain along the drainage stream (Refs. 8, pp. 19, 54, 56-62; 10, pp. 2, 3). The probable point of entry (PPE) into the surface water can be found at the confluence of the unnamed intermittent drainage way and Lake Hillsboro [Refs. 4, pp. 4, 5, 35, 36, 46A (15 mile surface water map); 8, pp. 2, 3, 10-12, 19, 33, 41; 10, pp. 2, 3; 12, p. 14; 25; 40].

The flow from the PPE is in Lake Hillsboro for one mile, ten miles in Middle Fork Shoal Creek and four miles in Shoal Creek to complete the 15–mile Target Distance [Refs. 3; 4, pp. 4, 5, 35, 36, 46A (15 mile surface water map); 8, pp. 2, 3, 10-12, 19, 33, 41; 10, pp. 2, 3; 12, p. 14; 25; 40; 48, p. 1]. Lake Hillsboro ("Hillsboro Old City Lake") is listed as a sport fishing area by the Illinois Department of Natural Resources (Ref. 16, p. 3). Middle Fork Shoal Creek and (West) Fork Shoal Creek are listed as containing sports fish in the 1996 Illinois Fishing Guide (Ref. 17, p. 16). Lake Hillsboro is also listed on the 1996 Fishing Guide as containing sport fish and consisting of 94 acres (Ref 17, p. 16).

4.1.2.1 Likelihood of Release

The likelihood of release factor category has been evaluated for the observed release factor. Therefore, the potential to release factor has not been evaluated.

4.1.2.1.1 Observed Release

An observed release from the site to the unnamed tributary to Lake Hillsboro has been documented by chemical analysis of sediment samples collected during the 2005 ESI Addendum (Refs. 4, p. 110; 6, p. 14, 23; 8, pp. 6, 7, 12, 19-23, 25, 54, 56-62, 73; 41 pp. 23, 24, 27-30, 44-47, 49-50, 79, 81, 84-89, 90-92, 104; 42, pp. 2, 4, 5, 7, 8; pp. 23-25 of this document).

Chemical Analysis

Illinois EPA conducted an ESI Addendum in April 2005 (Refs. 4, p. 110; 8). During the Addendum, sediment samples were collected from Lake Hillsboro (Refs. 8, pp. 6, 12, 19; 49, p. 1). Sediment sampling locations from the 2005 Addendum are shown in Figure 4 (Ref. 8, p. 19). Analytical data from the 2005 ESI Addendum supports an observed release by chemical analysis to Lake Hillsboro, which is presented below.

- Background Sample:

In order for the background sample to provide a good comparison to those collected at the lake, the background and release samples should have similar soil characteristics, sample dates, and surrounding land uses (Refs. 6, pp. 14-19, 23; 8, pp. 6, 7, 12, 19-23, 25, 54, 56-62, 73; 41, pp. 23-25, 27, 28-30, 44-47, 49-50, 79, 81, 84-89, 90-92, 104; 42, pp. 2, 4. 5, 7, 8). The background sample was collected during a similar time and at approximately the same depth (Refs. 6, pp. 14-19, 23; 8, pp. 6, 7, 12, 19, 22, 25, 54, 56-62, 73; 49, p. 1). Similar sampling protocols and analysis were employed for the background and release samples (Ref. 8, pp. 6, 7, 12). The background sediment sample was obtained from 2 – 4 inches below ground surface (Refs. 6, p. 23; 8, p. 22). Physical characteristics of the sediment samples were similar to sediment samples collected along the drainage pathway. Sediment samples mainly consisted of silty clay with various amounts of sand and organic matter (Refs. 6, pp. 14-19, 23; 8, p. 22). The drainage pathway in the unnamed tributary proceeds from Eagle Zinc to Lake Hillsboro. It flows through wooded land that contains a wide floodplain with hills on the flanks (Refs. 4, p. 46A; 8, pp. 33, 41; 10, p. 2; 25; 40; 47, pp. 6, 10).

Sample ID	Sample Medium	Sample Location	Depth	Date	Reference
X201	Sediment	Lake Hillsboro	2-4 inches	4/27/05	Refs. 6, p. 23; 8, pp. 6, 12, 19, 22, 25, 73

- Background Concentration

The table below provides a summary of the concentrations of hazardous substances detected in the background sample collected from Lake Hillsboro during the 2005 ESI Addendum.

Background Sediment Sample

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Sample Quantitation Limit (mg/kg)	References
X201 (ME00P4)	Sediment	4/27/05	Cadmium	1.4	.241	8, pp. 6, 12, 19, 22, 25, 73; 41, pp. 81, 86-89, 104;
			Lead	45.6	.456	
			Zinc	1080	.375	

Note: a. SQL is a calculated value. Calculations are provided as a part of this documentation record (Ref. 13, p. 8).

- Contaminated Sample – (Ref 6, p. 13)

Sample ID	Sample Medium	Sample Location	Distance from PPE	Depth	Date	Reference
X210 (ME00M3)	Sediment	Lake Hillsboro	0 ft.	3-5 inches	4/26/05	8, pp. 6, 12, 19, 22, 25, 54

Note: Sample location is depicted in Reference 8, Figure 4, p. 19.

- Contaminated Sample:

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Sample Quantitation Limit (mg/kg) [a]	Background Concentration (mg/kg)	Reference
X210 (ME00M3)	Sediment	4/26/05	Cadmium	16.1	.276	1.4	Refs. 6, p. 14; 8, pp. 6, 12, 19, 22, 25, 54; 13, p. 10; 41, pp. 23, 27, 28-30, 44; 42, pp. 2, 4; 50, pp. 139-144, 150-153, 167.
			Lead	142	.516	45.6	
			Zinc	8120	.553	1080	

Notes: a. SQL is a calculated value. Calculations are provided as a part of this documentation record (Ref. 13, p. 10).

Attribution

The hazardous substances present in the observed release (cadmium, lead, and zinc) were also detected in the shallow slag pile (Source 1) and along the drainage route from the pile to the PPE (see Section 2.2.2 and the description of other possible sources on page 20 of this HRS documentation record).

The PPE for contamination of the surface water pathway occurs at the point where the unnamed tributary enters Lake Hillsboro [Refs. 4, pp. 4, 5, 35, 36, 46A (15 mile surface water map); 8, pp. 2, 3, 10-12, 19, 33, 41; 10, pp. 2, 3; 12, p. 14; 25; 40; 48]. Sample X210 was collected at this point (Refs. 6, p. 14; 8, pp. 6, 12, 19, 22, 25, 54). The unnamed tributary is classified as an intermittent stream and the average flow rate in cubic feet per second is unknown (Ref. 3, p.1). Drainage from the shallow slag pile at Eagle Zinc flows from the northeastern area of the property and under Industrial Park Road (Ref. 47, p. 6). From Industrial Park Road, it then flows northeasterly for approximately 3330 feet where it enters Lake Hillsboro [Refs. 3; 4, pp. 4, 5, 35, 36, 46A (15 mile surface water map); 8, pp. 2, 3, 10-12, 19, 33, 41; 10, pp. 2, 3; 12, p. 14; 25; 40].

The buildings located at the facility could also contribute to the contamination found at the Eagle Zinc facility. The buildings were not investigated during previous investigations, but according to a 1923 Sanborn map, the buildings have been there since 1923. Due to the nature of the operations and the handling of zinc, coal, and zinc oxide within the buildings, contamination could potentially be found in them (Refs. 34, p. 1; 47, pp. 3-7, 10).

No known regulated entities within 1 mile of the approximate center of the Eagle Zinc property handle cadmium, lead and zinc (Ref. 52, pp. 1-41). Potential sources identified in the EPA Enviromapper Database and located within 1 mile of Eagle Zinc are: an abrasives product company, a glass company, a pipe and tube company, a lumber company, a petroleum bulk station and terminal, a hospital, a ready mix concrete manufacturer, a county housing authority, a water treatment plant, a service company, an auto body shop, a power company, a dry cleaners, a couple of service stations, a moto mart, and a waste water treatment plant (Ref. 52, pp. 6-41). Many of these facilities are conditionally exempt generators or those facilities, which have not handled hazardous waste which would be regulated under RCRA (Ref. 52, pp.

10, 11, 19, 22, 27, 28, 33, 34, 36, and 38). The pipe and tube company was established in 1978 and is a service center and distributor of prime and structural, carbon steel pipe, mechanical tubing, square and rectangular tubing, stocking a full range of products and grades (Ref. 53, pp. 1-3). The water treatment plant and the waste water treatment plant are the two facilities which have NPDES permits; however, it does not appear that these facilities discharge metals (Ref. 52, pp. 24, 40). The majority of these facilities are located to the south east, south, south west, and to the north west of Eagle Zinc. The overland flow from these facilities appears to drain into other surface water bodies Refs. 54, pp. 1, 2). The abrasives company is the only facility, which may drain into Lake Hillsboro; however, there is no information that this company utilizes metals in its process (Ref. 52, pp. 6, 7).

Hazardous Substances Released:

Cadmium
Lead
Zinc

Surface Water Observed Release Factor Value: 550

4.1.3 Human Food Chain Threat

Lake Hillsboro is utilized as a fishery (Ref. 26), therefore, the Human Food Chain Threat has been evaluated for the Surface Water Migration Pathway. Lake Hillsboro and its tributaries are composed of fresh water (Ref. 26, p. 1).

4.1.3.2 Human Food Chain Threat Waste Characteristics

As instructed in Section 4.1.3.2 of the HRS (Ref. 1 p. 51617), the waste characteristics factor category has been evaluated based on the toxicity/persistence/bioaccumulation and hazardous waste quantity factors.

4.1.3.2.1 Toxicity/Persistence/Bioaccumulation

As instructed in Section 4.1.3.2.1 and 4.1.2.2 of the Hazard Ranking System Final Rule (Ref. 1, pp. 51611-51612, 51617), those hazardous substances that are available to migrate from the sources at the site to surface water via the overland/flood hazardous substance migration path have been evaluated in determining the waste characteristics factor category value. This includes a) those substances that meet the criteria for an observed release to surface water (by chemical analysis) in the watershed and b) all hazardous substances associated with sources that have surface water containment factor values greater that zero for the watershed.

The table on the following page summarizes those hazardous substances which meet the criteria outlined in the above paragraph and have been evaluated in determining the waste characteristics factor category value. Each hazardous substance has been assigned an appropriate toxicity factor value from the Superfund Chemical Data Matrix (SCDM) (Ref. 2, pp. 1-28).

Each hazardous substance has also been assigned an appropriate persistence factor value from SCDM (Ref. 2, pp. 1-28). Lake Hillsboro is a fishery (Ref. 26). Therefore, as instructed in Section 4.1.2.2.1.2 of the HRS (Ref. 1, p. 51612), the persistence values for lakes have been selected.

Each hazardous substance has also been assigned an appropriate bioaccumulation potential factor value from SCDM (Ref. 2, pp. 1-28).

As instructed in Section 4.1.3.2.1.4 of the HRS (Ref. 1, p. 51618), each hazardous substance has been assigned a Toxicity/Persistence/Bioaccumulation Factor Value from Table 4-16 (Ref. 1, p. 51619).

The toxicity and persistence values, the bioaccumulation values, and the toxicity/persistence/bioaccumulation factor values for all hazardous substances associated with a source that has a surface water containment value greater than zero are presented in the table below. Values are based on freshwater. The combined toxicity/persistence/bioaccumulation factor values were obtained from HRS Table 4-16 (Ref. 1, p. 51619).

Hazardous Substance	Source No.	Toxicity Factor Value	Persistence Factor Value*	Bioaccumulation Value** (Food Chain)	Tox/Persistence/ Bio Factor Value (Table 4-21)	Ref.
Cadmium	1	10,000	1	5000	50,000,000	2, pp. 5, 6
Lead	1	10,000	1	5	50,000	2, pp. 15, 16
Zinc	1	10	1	5	50	2, pp. 27, 28
Arsenic	1	10,000	1	5	50,000	2, pp. 33, 34
Chromium	1	10,000	1	500	5,000,000	2, pp. 29, 30
Copper	1	0	1	500	0	2, pp. 31, 32
Nickel	1	10,000	1	0.5	5,000	2, pp. 35, 36
Silver	1	100	1	50	5,000	2, pp. 37, 38

Notes:
*Persistence value for Lake
**Bioaccumulation factor value for Freshwater
Food Chain: Toxicity/Persistence/Bioaccumulation Factor Value: 50,000,000 or 5×10^7

4.1.3.2.2 Hazardous Waste Quantity

Source No.	Source Type	Source Hazardous Waste Quantity
1	Shallow Slag pile	33,125.1

Sum of Values: 33,125.1

Hazardous Waste Quantity Factor Value: 10,000
(Ref. 1, Table 2-6)

* As documented in Section 4.1.3.3.2.2, targets along the surface water migration pathway are subject to Level II concentrations; therefore, a HWQ value from Table 2-6 or 100, whichever is greater, as the hazardous waste quantity factor value for that pathway (Ref. 1, pp. 51592, 51621).

4.1.3.2.3 Waste Characteristics Factor Category Value

The waste characteristics factor value is obtained by multiplying the toxicity/persistence factor value and the HWQ factor value for the watershed and multiplying this product by the bioaccumulation potential factor value for that hazardous substance (Ref. 1, Section 4.1.3.2.3, p. 51620). The product is assigned a waste characteristic factor category value from HRS Table 2-7 (Ref. 1, Section 2.4.3.1, p. 51592).

FOOD CHAIN:
Cadmium:
Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^7
Hazardous Waste Quantity Factor Value: 10,000

Toxicity/Persistence/Bioaccumulation Factor Value (5×10^7) x
Hazardous Waste Quantity Factor Value (10,000): 5×10^{11}

Waste Characteristics Factor Category Value: 560
(Ref. 1, Table 2-7)

4.1.3.3 Human Food Chain Threat Targets

Section 4.1.3.3 of the HRS (Ref. 1, p. 51620) states that a fishery within the target distance limit of the watershed is subject to actual human food chain contamination if a hazardous substance with a bioaccumulation potential factor of 500 or greater is present in surface water or sediment samples from the watershed at a level that meets the criteria for an observed release to the watershed from the site and at least a portion of the fishery is within the boundaries of the observed release (Ref. 1, p. 51620). An observed release to Lake Hillsboro by chemical analysis was documented in sample X210 located at the PPE for Lake Hillsboro (see Section 4.1.2.1.2 of this document).

4.1.3.3.1 Food Chain Individual

Level I concentrations have not been documented at Lake Hillsboro. Lake Hillsboro, a fishery, is subject to Level II concentrations. As instructed in Section 4.1.3.3.1 of the HRS (Ref. 1 p. 51620), the food chain individual factor has been assigned a value of 45.

4.1.3.3.2 Population

The population factor has been evaluated only for the Level II Concentrations factor as Lake Hillsboro is a fishery subject to Level II Concentrations.

4.1.3.3.2.1 Level II Concentrations

Actual contamination at Level II concentrations is shown in the preceding sections by establishing an observed release by chemical analysis to sediment of cadmium, lead, and zinc to Lake Hillsboro. According to an Illinois Department of Natural Resources document, Lake Hillsboro is a 93.5-acre lake (Ref. 26, p. 1). The level II contamination is limited to sample X210 located at the PPE of Lake Hillsboro

(Refs. 41, p. 23, 44; 42, pp. 2, 4). According to an Illinois Department of Natural Resources representative Lake Hillsboro has been stocked for a number of years and is used by hundreds of anglers each year, with many harvesting fish for human consumption (Ref. 26, p. 1). The amount of fish harvested each year is not known; however, it is estimated to be greater than 0 pounds per year. As instructed in Section 4.1.3.3.2.1 and Table 4-18 of the HRS (Ref. 1 pp. 51620, 51621), the human food chain population value has been assigned a value of 0.03.

4.1.4 Environmental Threat Targets

At this time the environmental threat was not evaluated, even though there are wetlands present at Lake Hillsboro and the unnamed tributary. The wetlands were not evaluated due to insufficient frontage area along Lake Hillsboro and the unnamed tributary. Representatives of the Illinois Natural History Survey conducted a wetland survey on January 31, 2006. Information generated during the survey is listed in the Wetland Report dated February 22, 2006 (Ref. 33, pp. 1-11).